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10/780,772	02/19/2004	Kentaro Shimada	H-1131	2065

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EXAMINER
FLOURNOY, HORACE L

ART UNIT	PAPER NUMBER
2189	

DATE MAILED: 02/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/780,772	SHIMADA ET AL.
	Examiner	Art Unit
	Horace L. Flournoy	2189

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on <u>11/17/2005</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2 and 4-18* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 4-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All b)☐ Some * c)☐ None of:

    1.☒ Certified copies of the priority documents have been received.

    2.☐ Certified copies of the priority documents have been received in Application No. _____.

    3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Response to Amendment

The examiner acknowledges the applicant's amendment filed on 11/17/2005.

Claims 1,2, and 4-18 are pending. Applicants' arguments have been carefully and

respectfully considered in light of the instant amendment.

STATUS OF CLAIM FOR PRIORITY IN THE APPLICATION

The examiner apologizes for the typographical error with regard to priority of the

instant application in the previous Office action. Acknowledgment is made of applicant's

claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in

parent Application No. 2003-362750, filed on 10/23/2003.

REJECTIONS BASED ON PRIOR ART

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section
122(b), by another filed in the United States before the invention by the applicant for patent or
(2) a patent granted on an application for patent by another filed in the United States before
the invention by the applicant for patent, except that an international application filed under
the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an
application filed in the United States only if the international application designated the United
States and was published under Article 21(2) of such treaty in the English language.

Claims 1-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Doing

et al. (U.S. PG Pub no. 2003/0009648 hereafter referred to as Doing).

With respect to **independent claims 1, 16, and 18**,

"A storage to be connected to a network, **[FIG. 1 element 111: "Storage IOP"**

also see paragraph [0018], "...coupled to a network"] *comprising: a host*

interface **[FIG. 1, elements 110, 114/115. The host is interpreted by the**

examiner as a workstation. Both workstation elements 114 and 115

interface to a network via elements 110 and 114/115] *which is arranged to be*

connected to the network **[paragraph [0018], "...coupled to a network"]** *and to*

receive file access; **[paragraph [0055], "...instructions or data must be**

fetched or stored." See FIGs. 1 & 2] *a plurality of disk drives* **[FIG. 1, elements**

111 and 112, "DASD"] *and a control unit* **[is disclosed on page 3, paragraph**

[0035]] *which translates the file access into block access* **[is disclosed in**

paragraphs [0037] and [0047]] *and controls the plurality of disk drives on the*

basis of the block access **[is disclosed in paragraph [0035]]** *the control unit*

including a first processor **[FIG. 1, element 101A]** *which translates the file*

access into the block access, **[paragraph [0037]]** *a second processor* **[FIG. 1,**

element 101B, e.g.] *which controls the plurality of disk drives on the basis of the*

block access, **[Doing discloses a "storage control portion" (FIG. 2, element**

221) which is included on every CPU. See paragraph [0116]. Doing teaches

accessing the disk drive ("secondary storage such as a disk drive") on the

basis of block access.] *a cache memory,* **[FIG. 1, elements 106, 107 and 108]**

and a disk interface which connects the second processor and the plurality of

disk drives;" **[See FIG. 1, elements 111, 112. The second processor**

connects the disk interface (Storage IOP) to the plurality of disk drives

(DASD) through elements 105, 110.] _wherein the control unit logically partitions_

the host interface, **[FIG. 1, elements 114,115]** _the first processor,_[e.g. **FIG. 1**

element 101A, "CPU" See paragraph [0054] for further logical partitioning

of individual processors through multithreading] _the second processor,_[**e.g.**

FIG. 1 element 101A, "CPU" See paragraph [0054] for further logical

partitioning of individual processors through multithreading] _the cache_

memory,[e.g. **FIG. 1 elements 106, 107, 108, L1 and L2]** _the disk interface,_

[FIG. 1 elements 111 and 112. The "Storage IOP" (111 and 112) can be

logically partitioned] _and,_ _the plurality of disk drives,_ **[FIG.1, "DASD"]** _and_

causes the partitioned host interface, the partitioned first processor, the

partitioned second processor, the partitioned cache memory, the partitioned disk

interface, and the partitioned plurality of disk drives to operate as a plurality of

virtual storages independently **[is disclosed in paragraph [0065]]**

With respect to **claim 2, and independent claim 18,**

"A storage according to claim 1, wherein the control unit further includes a

plurality of cache memories, **[FIG. 1, elements 106, 107, 108]** _and the plurality of_

cache memories is logically partitioned and allocated to the respective plurality of

virtual storages" **[is disclosed in paragraphs [0053] and [0065] and FIG. 1 and**

2] [FIG. 1 teaches the implementation of the control unit (multiple

processors) and FIG. 2 teaches the implementation of a plurality of cache

memories.   Since Doing is partitioning the plurality of processors, the plurality of cache memories are also logically partitioned and allocated to the respective plurality virtual storages.]

With respect to **claims 4, 6, and 7**,

"A storage according to claim 2, wherein the first processor executes a first hypervisor which performs logical partitioning of the host interface and the first processor **[is disclosed in paragraphs [0035] and [0036] and FIG. 1]** *and wherein the second processor executes a second hypervisor which performs logical partitioning of the plurality of cache memories, the disk interface, the plurality of disk devices and the second processor"* **[is disclosed in paragraphs [0029] and [0036] and FIG. 1]**

With respect to **claim 5, and independent claim 18**,

"A storage according to claim 4, wherein the control unit further includes a plurality of memories which are used by the first processor and a plurality of communication units which connect the first processor and the second processor **[is disclosed in FIG. 1 and paragraph [0053]]** *wherein the plurality of memories are logically partitioned by the first hypervisor* **[Doing discloses in paragraph [0138], "The ability of code in hypervisor state to alter the information in configuration register 910 means that the logical partitioning of a system can be dynamically changed. E.g., processors and other resources can be re-allocated to different logical partitions..." Also see paragraph [0065]]** *and*

the plurality of communication units are logically partitioned by the second hypervisor **[is disclosed in paragraphs [0035] and [0036]]**

With respect to **claims 8, 11, and 16,**

"A storage according to claim 2 further connected to a supervising terminal, **[FIG. 1, "workstation" elements 114, 115]** *wherein the control unit performs the logical partitioning on the basis of information inputted from the supervising terminal"* **[is disclosed in paragraphs [0042] and [0046]. See FIG. 6]**

With respect to **claims 9 and 12,**

"A storage according to claim 8, wherein, if information to be inputted to the supervising terminal is information to the effect that a host system using the storage emphasizes data transfer rate, an amount of allocation of the plurality of cache memories to a virtual storage to be used by the host system among the plural virtual storages is increased" **[is disclosed in paragraph [0084], FIGs. 1-3, and 7]**

With respect to **claim 10,**

"A storage according to claim 8, wherein, if information to be inputted to the supervising terminal is information to the effect that a host system using the storage performs random access in a large area, an amount of allocation of the plurality of cache memories to a virtual storage to be used by the host system among the plural virtual storages is reduced" **[is disclosed in paragraph [0084], FIGs 1-3, and 7] [Doing teaches, the instruction (from a supervising**

terminal) has an importance in response time (Where L11-cache cannot

respond (i.e., the requested instruction is not in L11-cache), a longer path

via cache fill bus 233 through memory management unit 222 must be

taken), then reduce the amount of allocation of shared cache to a virtual

partition. Doing teaches that an allocation of cache is reduced for a

particular partition (processor) when another processor is utilizing it.]

Note: As applicant alleges on page 15 of the instant remarks, the amendments to

claims 13-15 do *not* narrow their scope. Accordingly, the previous rejection

should stand by itself. However, should it be found that such amendments do in

fact narrow the scope, the limitations are shown in paragraphs [0138] and [0065].

With respect to **claim 13,**

> "*A storage according to claim 8, wherein, if information to be inputted to the*
>
> *supervising terminal is information to the effect that a host system using the*
>
> *storage requires access to a smaller number of large files than that for which*
>
> *processor support to one of the virtual storages is currently set for the host*
>
> *system, an amount of allocation of the first processor to the virtual storage to be*
>
> *used by the host system is reduced, and an amount of allocation of the second*
>
> *processor to the virtual storage is increased.*" **[Armstrong teaches amount of**
>
> **allocation of the first processor to the a virtual storage to be used by the**
>
> **host system among the plural virtual storages is reduced, and an amount**
>
> **of allocation of the second processor to the virtual storage is increased**

(...each logical partition is allocated one or more processors 12, as well as a portion of the available memory space for use in virtual memory 60. Logical partitions can share specific hardware resources such as processors, such that a given processor is utilized by more than one logical partition.)]

With respect to **claim 14,**

"A storage according to claim 8, wherein, if information to be inputted to the supervising terminal is information to the effect that a host system using the storage <u>requires access to</u> a larger number of small files <u>than that for which processor support to one of the virtual storages is currently set for the host system,</u> an amount of allocation of the first processor to the virtual storage to be used by the host system is increased, and an amount of allocation of the second processor to the virtual storage is reduced" **[is disclosed in Armstrong et at., column 4, lines 35-67(U.S. Pat. no. 6,279,046, incorporated by reference by Doing and hereafter referred to as Armstrong)] [Armstrong teaches amount of allocation of the first processor to the a virtual storage to be used by the host system among the plural virtual storages is increased, and an amount of allocation of the second processor to the virtual storage is reduced (...each logical partition is allocated one or more processors 12, as well as a portion of the available memory space for use in virtual memory 60. Logical partitions can share specific hardware resources such as processors, such that a given processor is utilized by more than one logical partition.)]**

With respect to **claim 15**,

> *"A storage according to claim 11, wherein if information to be inputted to the*
>
> *supervising terminal is information to the effect that a host system using the*
>
> *storage requires sequential access to* **[is disclosed in paragraph [0084]]** *a*
>
> *larger file than that for which communication unit support to one of the virtual*
>
> *storages is currently set for the host system, an amount of logical allocation of*
>
> *the plurality of communication units to the virtual storage to be used by the host*
>
> *system is reduced."* **[is disclosed in Armstrong et at., column 4, lines 47-**
>
> **67(U.S. Pat. no. 6,279,046, incorporated by reference by Doing and**
>
> **hereafter referred to as Armstrong).] [Doing discloses in paragraph [0138],**
>
> **"The ability of code in hypervisor state to alter the information in**
>
> **configuration register 910 means that the logical partitioning of a system**
>
> **can be dynamically changed. E.g., processors and other resources can be**
>
> **re-allocated to different logical partitions..."]**

With respect to **claim 17**,

> *"A storage system according to claim 16, wherein the information inputted to the*
>
> *supervising terminal is information on characteristics of accesses of a computer*
>
> *using the storage,* **[Doing discloses in paragraph [0138], "The ability of code**
>
> **in hypervisor state to alter the information in configuration register 910**
>
> **means that the logical partitioning of a system can be dynamically**
>
> **changed. E.g., processors and other resources can be re-allocated to**
>
> **different logical partitions..."]** *and the storage calculates an amount of logical*
>
> *partitioning of resources provided in the storage on the basis of the information*

on characteristics of accesses inputted to the supervising terminal, and performs

the logical partitioning using a result of the calculation." **[disclosed in**

paragraphs [0040] and [0042]] [Doing teaches the inputted information to

the supervising terminal (via operating system software) has

characteristics of accesses of a computer using the storage (running in

hypervisor state). The storage (NAS or system) calculates an amount of

logical partitioning of resources provided in the storage (configuration

information) on the basis of the inputted information and performs the

logical partitioning using the result of the calculation (dynamically re-

allocate resources to logical partitions).]

ACKNOWLEDGMENT OF ISSUES RAISED BY THE APPLICANT

Response to Amendment

Applicant's arguments filed **November 17, 2005** have been fully considered but

they are not deemed to be persuasive and, as required by **M.P.E.P. 707.07(f)**, a

response to these arguments appears below.

The examiner acknowledges the changes made by the applicant in the

specification as noted on page 2 of the applicant's correspondence dated **November**

17, 2005.

ARGUMENTS CONCERNING FORMAL MATTERS

The applicant's traversal of the formal requirements requested by the examiner is

addressed in the following section as required by **M.P.E.P. 707.07(f).**

ARGUMENTS CONCERNING PRIOR ART REJECTIONS

1ST POINT OF ARGUMENT:

With respect to the arguments on page 14 of the applicant's remarks, acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). See above for details.

2ND POINT OF ARGUMENT:

With respect to the argument on page 17 of the applicant's remarks, the examiner believes that Doing does not expressly teach away from logically partitioning the disk control processors or the disk drive groups. When elements are shared, they are shared with regard to a particular set of partitions and a new set of partitions (with new parameters) will share different resources. The applicant's claimed invention, as discussed in the amended claims and highlighted in FIG.1, show partitioned devices (partitioning) that are shared depending on the partitioning description. Furthermore, the applicant's claims are all anticipated by Doing. Therefore, the examiner respectfully disagrees with the applicant's argument.

CONCLUSION

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

Status of Claims in the Application

The following is a summary of the treatment and status of all claims in the

application as recommended by **M.P.E.P. 707.07(i):**

CLAIMS NO LONGER IN THE APPLICATION:

Claim 3

A(4) CLAIMS REJECTED IN THE APPLICATION:

Claims 1-2, 4-18

Direction of Future Correspondences

Any inquiry concerning this communication or earlier communication from the

examiner should be directed to Horace L. Flournoy whose telephone number is (571)
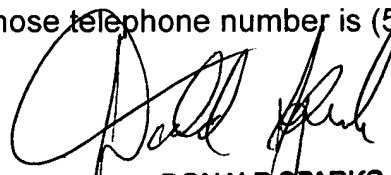
272-2705. The examiner can normally be reached on Monday through Friday 8:00 AM to 5:30 PM (ET).

Important Note

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Sparks can be reached on (571) 272-4201. The fax phone numbers for the organization where this application or proceeding is assigned is (703) 746-7239.

Information regarding the status of an Application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or PUBLIC PAIR. Status information for unpublished applications is available through Private Pair only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-2100.

DONALD SPARKS
SUPERVISORY PATENT EXAMINER

Horace L. Flournoy

Patent Examiner

Art unit: 2189

Supervisory Patent Examiner

Technology Center 2100